

## REVISION OF THE PLANTHOPPER GENUS *NEODURIUM* FENNAH (HEMIPTERA, FULGOROIDEA, ISSIDAE) WITH DESCRIPTION OF ONE NEW SPECIES FROM CHINA

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**Abstract** In the present paper *Neodurium* Fennah is revised, with the description and illustration of one new species, *N. hamatum* sp. nov. A revised diagnosis to this genus is given to supplement those compiled by others, and the genus is compared to the related genus *Duriopsis* Melichar and *Falvina* Stål. In addition, a key to all species of the genus is provided.

**Key words** Hemiptera, Fulgoroidea, Issidae, *Neodurium*, new species, China.

### 1 Introduction

The planthopper genus *Neodurium* Fennah, belonging to the tribe Parahiraciini (Hemiptera, Fulgoroidea, Issidae) (Zhang and Chen, 2008), was established by Fennah (1956) based on the only female specimen of *Neodurium postfasciatum* Fennah from Hubei, China. Recently, Ran, Liang and Jiang (2005) described *N. digitiformum* and *N. flatidum* respectively from Hubei and Yunnan, China. Moreover, two other Chinese species, *N. weiningensis* and *N. duplicadigitum*, were reported by Zhang and Chen (2008). Up to now, five species have been reported, which are all from China. Herein, we revise the genus *Neodurium* with the description of one new species from China, and provide a key to all species of the genus.

### 2 Materials and Methods

The genital segments of the examined specimens were macerated in 10 % KOH and figured in glycerin jelly using a Leica MZ125 stereomicroscope. Photographs of the specimens were made using a Nikon SMZ1500 stereomicroscope with a Q-image CCD. Images were produced using the software Synoptics Automontage. All the specimens studied are deposited in the Entomological Museum, Northwest A & F University (NWAUFU). Terminology used mainly follows Chan and Yang (1994).

### 3 *Neodurium* Fennah, 1956

*Neodurium* Fennah, 1956: 511.

Type species: *Neodurium postfasciatum* Fennah, by original designation.

Head with eyes more or less narrower than pronotum. Vertex approximately hexagonal with disc distinctly depressed, broader than long; lateral

margins carinate; anteriorly angularly convex, posteriorly angularly concave. Ocelli present. Frons with carina medially and two carinae laterally, disc slightly elevated, length greater than widest part ventrally; anterior margin distinctly concave, lateral margins nearly parallel; frontoclypeal suture weak to strongly arched. Clypeus elevated, smooth, without carina. Rostrum long, reaching to hind-trochanter. Pronotum short laterally, with pale tubercula; anterior margin distinctly convex, posterior margin horizontal to slightly convex; disc elevated with two pits. Mesoscutellum nearly triangular, with two pits along lateral margin; disc slightly elevated, with or without carina. Tegmen elongate, nearly quadrate, anterior margin and sutural margin more or less parallel; Sc long, extending beyond mid-length of tegmen; longitudinal veins prominent; transverse veins present but obscure; claval suture present but obscure apically (Figs 5, 12) or absent. Wing broader and a little shorter than tegmen, apically forming 2 lobes; veins reticulate. Legs relatively long, dilated; lateral margin of hind tibia with 3 teeth. Spinal formula of hind leg 8-(11-19)-2, indicating number of spines at apex of hind tibia and tarsomeres I and II.

Pygofer without spines. Aedeagus tubular, symmetrical, divided distally into dorsal and ventral lobes, the latter sometimes split, with a pair of elongate lateral lobes and a pair of spiniform processes lying ventrolaterally and directed either cephalad or caudad. Anal segment in dorsal view circular, or longer than wide.

Female genitalia with anal segment cup-like, longer than widest part. First valvula with several teeth on dorsal margin; third valvula nearly triangular.

**Diagnosis.** This genus resembles *Duriopsis*

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Melichar (Melichar, 1906), but differs from the latter by its vertex with apical margin slightly convex and posterior margin slightly concave, clypeus ecarinate; mesoscutellum nearly triangular; Sc and R of tegmina arising separately from base, claval suture present but obscure apically and fore femora foliately expanded. In addition, it is also similar to the genus *Flavina* Stål, but differs from the latter by frons with a pair of weak but distinct sublateral carinae enclosing an elongate-oval area of disc, strongly incurved basally to meet transversely at middle line; pro- and mesofemora compressed, hind tibia with 3 lateral teeth (the genus *Flavina*, frons with a subbasal transverse angulated ridge, between which and the basal margin are two foveations, hind tibia with 5–6 lateral teeth (Distant, 1906; Gnezdilov and Wilson, 2007; Gnezdilov, 2009).

Distribution. Oriental Region.

#### 4 Checklist of the species of *Neodurium*

*Neodurium postfasciatum* Fennah, 1956: 513, figs 24: E–I, China (Hubei, Sichuan).

*Neodurium digitiformum* Ran et Liang, 2005: 571, figs 9–16, China (Hubei).

*Neodurium flatidum* Ran et Liang, 2005: 572, figs 17–24, China (Yunnan).

*Neodurium weiningensis* Zhang and Chen, 2008: 65, figs 1–9, China (Guizhou).

*Neodurium duplicadigitum* Zhang and Chen, 2008: 66, figs 10–16, China (Yunnan).

*Neodurium hamatum* sp. nov., China (Yunnan).

#### Key to species of *Neodurium* Fennah.

1. Tegmen with claval suture ..... 2  
Tegmen without claval suture ..... 3
2. Claval suture present only at base; aedeagus with two smooth spiniform processes directed cephalad ..... *N. postfasciatum*  
Claval suture present but obscure apically; aedeagus with two hook-like processes directed laterad ..... *N. hamatum* sp. nov.
3. Aedeagus without process on dorsal margin (Ran et al., 2005: fig. 23) ..... *N. flatidum*  
Aedeagus with processes near basal 1/3 of dorsal margin (Zhang et al., 2008: figs 7, 16; Ran et al., 2005: fig. 15) ..... 4
4. Dorsal processes of aedeagus large, fan-like (Zhang et al., 2008: fig. 7) ..... *N. weiningensis*  
Dorsal processes of aedeagus small, finger-like (Zhang et al., 2008: fig. 16, Ran et al., 2005: Fig. 15) ..... 5
5. Aedeagus with one dorsal process, forked apically (Ran et al., 2005: fig. 15); spinal formula of hind leg 8-19-2 ..... *N. digitiformum*  
Aedeagus with a pair of dorsal processes (Zhang et al., 2008: fig. 16); spinal formula of hind leg 6-10-2 ..... *N. duplicadigitum*

#### 4.1 *Neodurium digitiformum* Ran et Liang, 2005

*N. digitiformum* Ran et Liang, 2005: 571, figs 9–16.

Material examined. 1 ♂ (holotype), Hubei, Shaping, 30 Sep. 1943, collector unknown. Paratypes: 7 ♂♂, 2 ♀♀, same data as holotype.

Distribution. China (Hubei).

#### 4.2 *Neodurium flatidum* Ran et Liang, 2005

*N. flatidum* Ran et Liang, 2005: 572, figs 17–24.

Material examined. 1 ♂ (holotype), Yunnan, Anning, Wenquan, 9 Jan. 1958, coll. CHENG Han-

Hua. Paratype 1 ♂, same data as holotype.

Distribution. China (Yunnan).

#### 4.3 *Neodurium postfasciatum* Fennah, 1956

*N. postfasciatum* Fennah, 1956: 513, figs 24: E–I; Ran et al., 2005: 570, figs 1–8.

Material examined. 1 ♂, 1 ♀, Hubei, Shengnongjia, Jiuhu, 29 Aug. 1980, coll. CHEN Tong; 4 ♂♂, 11 ♀♀, Hubei, Shengnongjia, SONG Bo, 25 Aug. 1980, coll. CHEN Tong; 1 ♂, Hubei, Xingshan, Longmenhe, alt. 1 350 m, 13 Sep. 1993, coll. CHEN Jun; 1 ♀, Hubei, Xingshan, Longmenhe, alt. 1 350 m, 14 Sep. 1993, coll. SONG Shi-Mei; 1 ♀, Hubei, Xingshan, Longmenhe, alt. 1 500 m, 14 Sep. 1993, coll. LI Fa-Sheng; 1 ♀, Hubei, Xingshan, Longmenhe, alt. 1 100 m, 12 Sep. 1993, coll. YAO Jian; 1 ♀, Sichuan, Xichang, alt. 900–1 500 m, 3 Aug. 1957, collector unknown.

Distribution. China (Hubei, Sichuan, Yunnan).

#### 5 *Neodurium hamatum* sp. nov. (Figs 1–24)

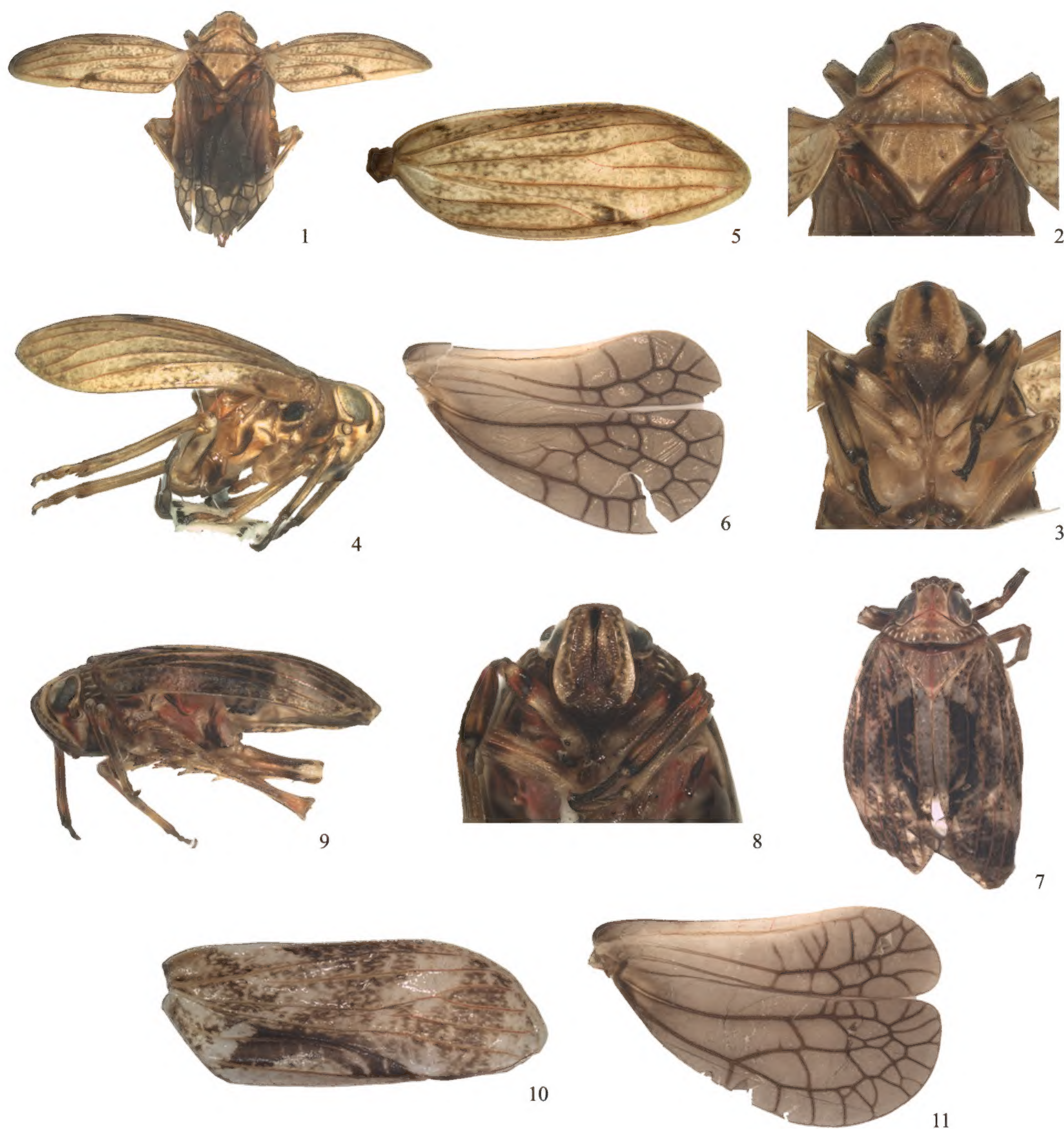
Description. Body length: male (including tegmen) 6.3 mm, female (including tegmen) 6.5 mm; length of tegmen: male 5.0 mm, female 5.2 mm.

Male. Body brown with black maculae (Fig. 1). Vertex brown with black maculae near lateral margins (Fig. 2). Eyes dark brown with borders orange. Frons brown with dark brown stripes and pale tubercula. Clypeus dark brown with lateral side brown (Fig. 3). Rostrum brown with apex black (Fig. 3). Pronotum yellowish-brown with pale brown tubercula, posterior part dark brown. Mesoscutellum brown with dark brown maculae (Fig. 2). Tegmen yellowish-brown with dark brown maculae, veins red (Figs 5, 12). Wing brown, veins dark brown (Figs 6, 13). Legs brown, fore-, meso- and hind femora with dark brown fasciae and stripes, tibiae with black maculae (Fig. 4). Abdomen dark brown with black spots.

Female. Body generally pale testaceous with black markings (Fig. 7). Tegmina pale brown with black marking (Fig. 10). Legs brown with dark brown and red fasciae (Fig. 9).

Vertex with lateral and middle carinae distinct, disc distinctly depressed, 1.2 × wider at apex than long in middle line. Frons with central carina and inverted U-shaped lateral carina dorsally, tubercula laterad lateral carina, greatest width ventrally approximately 1.6 × narrowest width beyond eyes dorsally, apex slightly expanded (Fig. 8). Thorax with disc and apical angles of pronotum with central carina and tubercula; mesoscutellum with indistinct median and 5 lateral carinae, greatest width 2 × medial length. Tegmen with many irregular maculae, 1.8 × longer than widest part; Sc long, reaching beyond





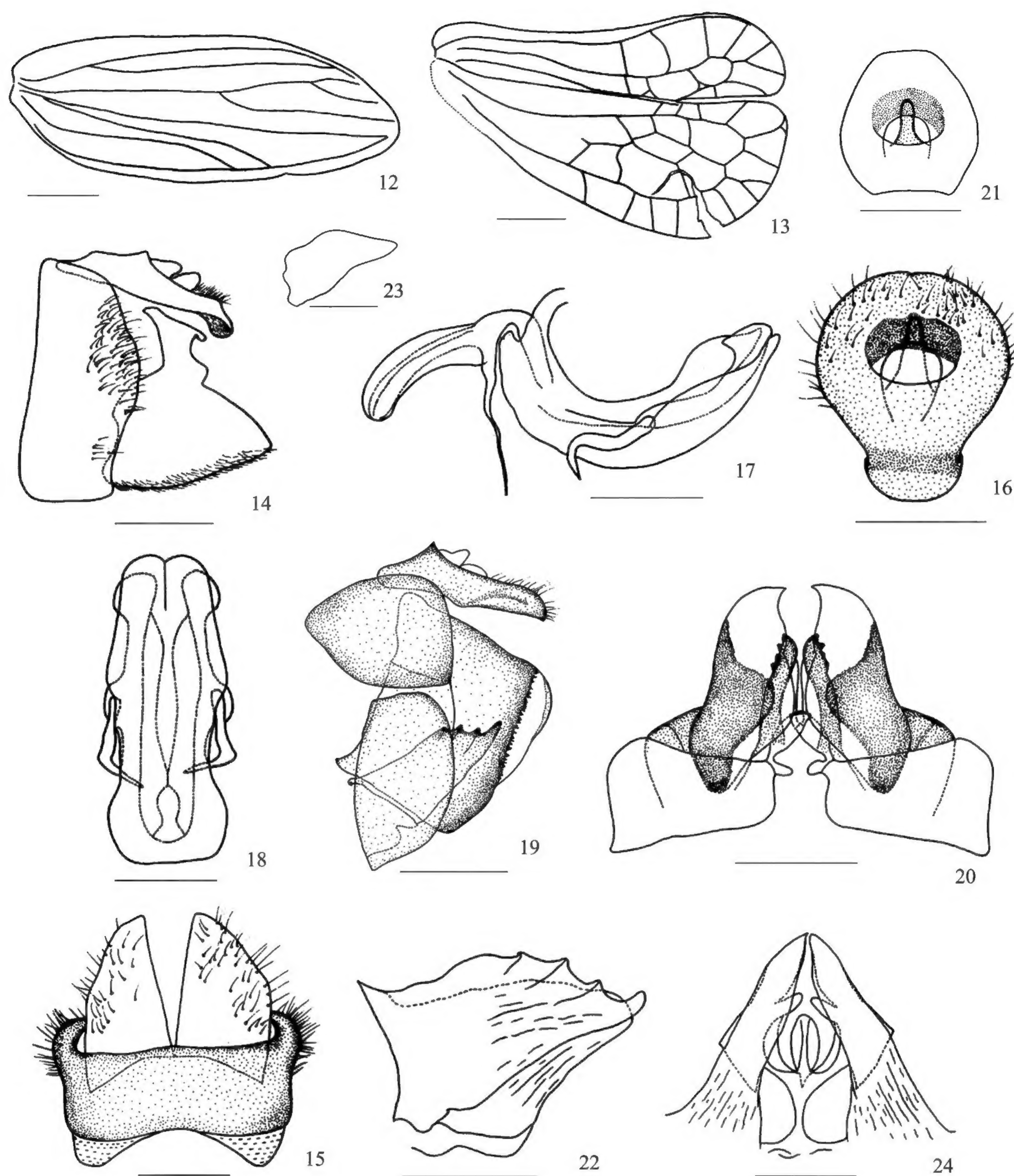
Figs 1 – 11. *Neodurium hamatum* sp. nov. 1 – 6. Holotype. 7 – 11. Paratype. 1, 7. Habitus, dorsal view. 2. Head and thorax, dorsal view. 3. Head and thorax, ventral view. 4, 9. Habitus, lateral view. 5, 10. Tegmen. 6, 11. Wing. 8. Head, ventral view.

midlength of tegmen, Sc and R separated near base; M divided into three branches; Cu not forked (Fig. 10); Wings  $0.9 \times$  length of tegmen, veins distinct (Fig. 11). Hind tibia with 3 lateral teeth near apex. Spinal formula of hind leg 8-9-2 (male) or 8-10-2 (female).

**Male genitalia.** Anal segment in lateral view (Fig. 14) tapering distally with ventral margin relatively straight, approximately mushroom-like in dorsal view (Fig. 16) with apical margin rounded, anal foramen near apex. Pygofer (Fig. 14) with caudal margin

rounded, anterior margin and ventral margin (Fig. 15) nearly straight. Aedeagus (Fig. 17) in profile strongly curved with 2 hook-like processes at mid, directed laterad; dorsal lobe split into 3 branches, in lateral view swelled at apex and with apex tapering; lateral lobes with apex expanded and outer margin cornered in lateral view; ventral lobe with ventral margin curved in lateral view and split into 2 branches in ventral view (Fig. 18). Genital styles moderately long, nearly triangular, apical margin undec (Fig. 14); two genital styles connected with lateral margins,





Figs 12 – 24. *Neodurium hamatum* sp. nov. 12. Tegmen. 13. Wing (outer margin damaged). 14. Male genitalia, left side. 15. Male genitalia, ventral view. 16. Male anal segment, dorsal view. 17. Aedeagus, lateral view. 18. Aedeagus, ventral view. 19. Female genitalia, left side. 20. Female genitalia, ventral view. 21. Female anal segment, dorsal view. 22. First valvula, left side. 23. Second valvula, left side. 24. Second valvula, caudal view. Scale bars: 12 – 13 = 1.0 mm, 14 – 24 = 0.5 mm.

evenly curved (Fig. 15).

Female genitalia. Anal segment in dorsal view (Fig. 21) elliptical with lateral margins convex, apical and basal margins nearly truncate, length at mid same as greatest width, anal foramen near middle. Ovipositor with first valvula curved dorsally with 4 nearly parallel teeth (Figs 19 – 20, 22). Second valvula membranous, triangular in lateral view (Fig.

23), connected subapically in caudal view (Fig. 24). Third valvula (Figs 19 – 20) nearly quadrangular, dorsal and apical margins membranous and transparent with minute teeth near apex.

Holotype ♂, China, Yunnan, Menglun, 23 July 2009, coll. ZHANG Lei (NWAUFU). Paratype 1 ♀, same data as holotype except 12 July 2009.

Remarks. This species resembles *Neodurium*



*postfasciatum* Fennah, 1956, but differs from the latter in the following characteristics: claval suture present but obscure apically, apical margin of anal segment not curved cephalad, and aedeagus with a pair of hook-like processes.

**Etymology.** The specific name is derived from the Latin word “*hamatus*”, referring to the aedeagus with a pair of hook-like processes.

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## 中国扁足瓢蜡蝉属订正及一新种记述

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**摘要** 对瓢蜡蝉科 Issidae 扁足瓢蜡蝉属 *Neodurium* Fennah 进行了订正。记述中国扁足瓢蜡蝉属 4 种, 包括 1 新种, 钩扁足瓢蜡蝉 *Neodurium hamatum* sp. nov., 提供了形态及雌雄性外生殖器特征图。制作了本属分布于中国的 7 个种的分种检索表。

**钩扁足瓢蜡蝉, 新种 *N. hamatum* sp. nov.** (图 1~24)

新种与 *Neodurium postfasciatum* Fennah 相近似, 其区别主要

**关键词** 半翅目, 蜡蝉总科, 瓢蜡蝉科, 扁足瓢蜡蝉属, 新种, 中国.

**中图分类号** Q969.35

在于: 前翅有爪缝, 但端部较模糊, 肛节端部不弯曲, 阳茎具 1 对钩状突起。新种模式标本保存在西北农林科技大学昆虫博物馆。

正模 ♂, 云南勐仑, 2009-07-23, 张磊采。副模 1 ♀, 云南勐仑, 2009-07-12, 张磊采。

词源: 新种种名据其阳茎具钩状突起而定名。

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